Code No: R1622041 **R16** SET - 1

II B. Tech II Semester Regular Examinations, April - 2018
ELECTRONIC CIRCUIT ANALYSIS
(Com to ECE,EIE)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer**ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What is effect of negative feedback on amplifier gain? Prove it.	(3M)
	b)	Why LC oscillators are not used at low frequencies.	(3M)
	c)	State the advantages of push-pull configuration.	(2M)
	d)	Define Q factor of tuned amplifier	(2M)
	e)	Classify power Amplifiers	(2M)
	f)	List out different types of coupling used in multistage amplifiers.	(2M)

PART -B

2.	a)	Derive the voltage gain equation for common source amplifier at high frequencies.	(7M)
	b)	Define f_T and derive an expression for it.	(7M)
3.	a)	Derive the expression for input resistance of a Darlington pair circuit.	(7M)
	b)	Derive expressions for R_i, R_o ,A_v&A_i using h-parameter model of a CC- CE amplifier?	(7M)
4.	a)	Derive the expression for output resistance of a voltage sampled circuit.	(7M)
	b)	Analyze CE with R_e circuit with Load R_L using feedback concept.	(7M)
5.	a)	With the help of suitable schematic explain the operation of a Wien Bridge oscillator and derive an expression for its frequency of operation..	(7M)
	b)	State and explain barkhausen criterion.	(7M)
6.	a)	Derive the expression for the harmonic distortion in a power amplifier if the relation between input and output currents is n^{th} order.	(7M)
	b)	Explain the operation of class B push-Pull power amplifier.	(7M)
7.	a)	Derive an expression for bandwidth of a capacitive coupled tuned amplifier.	(7M)
	b)	Give classification of tuned amplifiers.	(7M)
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Code No: R1622041 **R16** SET - 2

II B. Tech II Semester Regular Examinations, April - 2018
ELECTRONIC CIRCUIT ANALYSIS
(Com to ECE, EIE)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer**ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define tilt and derive an expression for it. (3M)
   b) Show that band width improved with negative feedback. (3M)
   c) Why RC oscillators are not used at high frequencies. (2M)
   d) Classify tuned amplifiers. (2M)
   e) Show that the power amplifier acts as a rectifier. (2M)
   f) Explain about bootstrapping. (2M)

PART -B

2. a) Perform the high frequency analysis of a common drain amplifier. (7M)
   b) Explain various high frequency parameters of a BJT and derive the relation between them. (7M)

3. a) With the help of a neat circuit diagram, describe the working of a cascode amplifier. (7M)
   b) Find the expression for CMRR of a BJT based differential amplifier. (7M)

4. a) An amplifier has a gain of 50 with negative feedback. For a specified output voltage,if the input required is 0.1V without feedback and 0.8V with feedback, Compute β and open loop gain (7M)
   b) Show that input resistance increases with series mixing. (7M)

5. a) Derive the expression frequency of oscillation and condition for sustained oscillations of a BJT based RC Phase shift oscillator. (7M)
   b) Explain the concept of frequency and amplitude stability of oscillators. (7M)

6. a) Explain the operation of class A push-pull power amplifier. (7M)
   b) Show that the conversion efficiency of a transformer coupled power amplifier is 50%. (7M)

7 Write short notes on the following
   a) Double tuned amplifiers (7M)
   b) Q factor of a single tuned amplifier. (7M)

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Code No: R1622041 **R16** SET - 3

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Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer**ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define rise time and derive an expression for it. (3M)
   b) An n number of stages are connected in cascade. Derive the expressions for the overall lower and higher cutoff frequencies. (3M)
   c) Show that gain reduces with negative feedback. (2M)
   d) Compare Frequency stability of crystal oscillator, RC and LC oscillators (2M)
   e) Define thermal runaway (2M)
   f) What are the limitations of Single tuned amplifier? (2M)

PART -B

2. a) Derive the expression for the high frequency parameters in terms of low frequency parameters of a BJT. (7M)
   b) Derive the expressions for f_T and f_β (7M)

3. a) Derive an expression for the overall higher cut-off frequency of a two stage amplifier with identical stages of individual higher cut-off frequency, f_H (7M)
   b) Discuss the effect of emitter bypass capacitor on thelower cut-off frequency of amplifier. (7M)

4. a) Draw the circuit diagram of a current series feedback amplifier, Derive expressions of input & output impedances, Gain, feedback factor (7M)
   b) If negative feedback with a feedback factor, β of 0.1 is introduced into an amplifier with again of 20 and bandwidth of 0.6 MHz, obtain the resulting bandwidth of the feedback amplifier. (7M)

5. a) Derive the expression frequency of oscillation and condition for sustained oscillations of a FET based RC Phase shift oscillator. (7M)
   b) Draw the equivalent of a crystal and derive the relation between series and parallel frequencies. (7M)

6. a) A single ended class A amplifier has a transformer coupled load of 8 Ω. If the transformer turns ration is 10, find the maximum power output delivered to the load.Take the zero signal collector current of 500mA. (7M)
   b) What is a cross over distortion and explain a remedy for it. (7M)
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7 Write short notes on the following

a) Wideband amplifiers (7M)

b) Stagger tuned amplifiers. (7M)

Code No: R1622041 **R16** SET - 4

II B. Tech II Semester Regular Examinations, April - 2018
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Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer**ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Mention various hybrid π capacitances of a BJT.	(3M)
	b)	Derive CMRR.	(3M)
	c)	Enumerate the steps in the analysis of negative feedback amplifiers.	(2M)
	d)	Draw the topologies in negative feedback.	(2M)
	e)	What is the need of CLAPP oscillator?	(2M)
	f)	Define gain bandwidth product of an amplifier.	(2M)

PART -B

2.	a)	Derive the expression for CE short-circuit current gain with resistive load.	(7M)
	b)	Explain various hybrid-pi capacitances and conductances of a BJT.	(7M)
3.	a)	Discuss the effect of coupling capacitors of a CE amplifier on the overall frequencyresponse of the amplifier	(7M)
	b)	Compute the overall lower and upper cut-off frequency of an identical three stage cascade of amplifierswith individual lower and upper cut-off frequency given as 20Hz and 20KHz.	(7M)
4.	a)	Explain the concept of feedback with block diagram. What arethe advantages and disadvantages of negative feedback?	(7M)
	b)	An amplifier has a gain of 50 with negative feedback. For a specified output voltage, if theinput required is 0.1V without feedback and 0.8V with feedback, Compute β and open loop gain	(7M)
5.	a)	Derive the expression frequency of oscillation and condition for sustained oscillations of a Colpitts oscillator.	(7M)
	b)	Derive the basic conditions for oscillations and classify oscillators	(7M)
6.	a)	With the help of a suitable circuit diagram, show that the maximum conversion efficiency of a class B power amplifier is 78.5%	(10M)
	b)	Explain the purpose of heat sink.	(4M)
7.	a)	Derive an expression for the bandwidth of a synchronous tuned circuit	(7M)
	b)	Discuss the necessity of stabilization circuits in tuned amplifiers.	(7M)
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